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possible; Mr. Ridgway sent me from the U. S. National Museum a large number of Mississippi Valley birds, and from the same region I also received specimens from Mr. Ruthven Deane, Mr. Gustave Kohn, Dr. A. K. Fisher, and Dr. F. W. Langdon. Mr. E. M. Hasbrouck permitted me to examine his types of *roscoe*; I had access to a large series of *trichas* containing many fall specimens, in the collection of Mr. J. Dwight, Jr., and have also examined the collections of Mr. George B. Sennett and Dr. E. A. Mearns. To all these gentlemen I return my most grateful thanks; their uniform courtesy in complying with my request has made the gathering of material a pleasure rather than a task.

A SUMMARY OF OBSERVATIONS ON THE BIRDS OF THE GULF COAST OF FLORIDA.

BY W. E. D. SCOTT.

(Continued from Vol. VI, p. 252.)

Lanius ludovicianus. **LOGGERHEAD SHRIKE.**—A common resident species at all points visited on the Gulf Coast. In the vicinity of Tarpon Springs they begin to breed by the last of March. They were common and bred at Punta Rassa, but Mr. Atkins has no records of the species at Key West.

Vireo altiloquus barbatulus. **BLACK-WHISKERED VIREO.**—A regular and common migrant, breeding on the Gulf coast of Florida at least as far north as Anclote Keys, where the birds are *common* during the summer months. They arrive at this point from the south about the last of any of the birds, not appearing till May 18, which is the earliest record, and not becoming common until the first week in June. The species seems to be confined to the low mangrove keys at this point, and rarely visits the main land. Yet it has been taken at Tampa, and and I have observed it on two occasions in the town of Tarpon Springs, both times late in the summer of 1886.

Mr. Atkins has observed and taken the birds at both Punta Rassa and Key West, where it is by no means uncommon. He says: "Arrived at Punta Rassa about May 18, 1886. Breeds in low thick growths of mangrove, both on the main land and on outlying keys. Last noted September 5, 1886. Taken at Key West, April 10 and 26, 1887, and observed

throughout June, 1888, and in the summer. Taken on September 5, 1888, and several times after, the latest being September 13." The birds have a song not unlike *Vireo olivaceus*, but usually delivered even more deliberately than the song of that species.

Vireo olivaceus. RED-EYED VIREO. — In the region about Tarpon Springs this is a common spring and fall migrant, arriving from the middle to last of March, and a number find a summer home at this point. Observed and taken throughout the summer of 1886. Took a young female, No. 5877, full-grown, June 3, 1888. Mr. Atkins says it is a common migrant both at Punta Rassa and at Key West, often being associated with *Vireo altiloquus barbatulus*.

Vireo gilvus. WARBLING VIREO. — Apparently a rare spring migrant in the vicinity of Tarpon Springs. Not observed in the fall. Mr. Atkins has not met with it at Punta Rassa or at Key West.

Vireo flavifrons. YELLOW-THROATED VIREO. — A rare migrant. At Tarpon Springs, April 26, 1887, I took an adult female, No. 3926. This is my only record. Mr. Atkins took it at Punta Rassa on April 5, 1886, and at Key West on April 1 and October 5, 1887.

Vireo solitarius. BLUE-HEADED VIREO. — A not uncommon migrant, and remains throughout the winter in small numbers in the vicinity of Tarpon Springs. The only point where Mr. Atkins has met with the species is Key West where he took a single bird on February 3, 1888.

Vireo noveboracensis. WHITE-EYED VIREO. — This bird appears to be, in the vicinity of Tarpon Springs, a rather rare migrant and winter resident. I have before me eight representatives taken, four in April and four in October, which are identical with White-eyed Vireos in my collection taken near Washington, D. C. These are all the Vireos that I have collected in this region which I can refer to true *noveboracensis*. They are about equally divided as to sex. Of the spring specimens two are males and two females, and the latter had not yet laid nor would they have laid for several weeks. It seems proper from these facts and those about to be presented in regard to *V. noveboracensis maynardi*, to consider true *noveboracensis* as a migrant and not as the form *breeding* in this part of Florida.

Vireo noveboracensis maynardi. KEY WEST VIREO. — Mr. Atkins has kindly sent me from the Island of Key West twenty-two representatives of this subspecies. Of these all but two were taken in April and May, and are doubtless all breeding birds. The other two specimens were taken in January and February and are very typical of this subspecies. Mr. Atkins finds the birds common, resident, and breeding in numbers. He has also sent me four White-eyed Vireos from Punta Rassa which match in all particulars the series of *Vireo noveboracensis maynardi* taken at Key West. I have before me twelve White-eyed Vireos taken at Tarpon Springs in the months of April, May, June, July, and September that so nearly match in all particulars the Key West birds of Mr. Atkins that they can only be looked upon as representatives of this subspecies. Three of these birds are fully fledged young birds of the year. The ear-

liest taken is No. 3370, ♀ *Juv.*, May 5, 1887. This bird, though only just fully grown, is quite recognizable as the subspecies in question, having the much more robust bill conspicuously developed. This and other characteristics of the subspecies are also clearly to be seen in the two other young birds, taken on June 12 and July 26 respectively. From the foregoing data it would seem probable that the breeding White-eyed Vireos of the Gulf coast, at least from Tarpon Springs south, are more properly referable to the subspecies *maynardi* than to the true *noveboracensis*.

Mniotilta varia. BLACK-AND-WHITE WARBLER. — This is a common migrant, but has not been observed in winter at Tarpon Springs. In the spring the birds arrive at this point about the last of March and are common until early in May, when for a short time they disappear. I have notes of their common occurrence in the third week of July, so they probably find a breeding ground at no very great distance.

Mr. Atkins has found the species to be common at both Punta Rassa and Key West at all times of the year except from May 2, when the last migrants to the north were noted, until July 13-16, when the birds returned in large numbers — both adults and young birds of the year.

Protonotaria citrea. PROTHONOTARY WARBLER. — During the spring migration, from March 30 until the latter part of April, and again from the last of July to the 20th of September, I have taken and observed this species in the vicinity of Tarpon Springs, but at no time can it be deemed a common bird at this point. Mr. Atkins has found it sparingly both at Punta Rassa and at Key West on the following dates: "Punta Rassa — August 28 and 29, 1886, and September 13 and 17 of the same year; Key West — April 6 and 11, and July 28, 1888; August 8, 1889, a single bird seen." These are all of his records.

Helinaia swainsonii. SWAINSON'S WARBLER. — I have been unable to detect the presence of Swainson's Warbler at or near Tarpon Springs at any time of the year. Mr. Atkins considers the species as very rare at Punta Rassa. At Key West on September 18 and 20, 1888, two birds were taken by him on each date, and during the present season, 1889, he writes of meeting with the birds but once, about the middle of September.

Helmitherus vermivorus. WORM-EATING WARBLER. — A rather uncommon migrant in the vicinity of Tarpon Springs. Appears about the 25th of March, remaining till late in April. I have not met with it at this point in the fall.

At Punta Rassa, Mr. Atkins found it a rather common migrant in the spring, and much rarer in the fall, when it appeared September 15 and remained but a few days. At Key West, he says: "1887, April 11, noted. Again on April 18. Returning, arrived August 30, and are more or less common until October 1." It is probable that a few individuals winter at Key West.

Helminthophila bachmani. BACHMAN'S WARBLER. — This bird has not been observed as yet on the Gulf coast in the vicinity of Tarpon Springs.

For records of its occurrence and capture by Mr. Atkins, on the Island of Key West during the seasons of 1887 and 1888, the reader is referred to 'The Auk,' Vol IV, p. 348, and Vol. V, pp. 428-430. During the season of 1889 Mr. Atkins has again had the opportunity to study this little-known and rare species, and has kindly sent me the following notes to be used in this connection: "Key West, Florida, 1889. First arrival from north, July 17, one adult male and one young female. Next observed July 23, three birds. Not seen again until July 31, though I was watching for them almost continually; three birds again on this date. August 4, found them more common, perhaps a dozen birds in all were seen. From this time till August 25 inclusive, I found them regularly in small numbers. On August 8, 11, and 25 they were most abundant, particularly so on the first-named date, when as many as twenty-five or thirty birds were seen. After the 11th there was a decline in the numbers until the 25th, when they were again almost as numerous as on the 8th, but none were observed after the 25th."

The following biographical notes, also made by Mr. Atkins, are submitted. "Bachman's Warbler in its habits is very much like the Parula Warbler (*Compsothlypis americana*). The resemblance is more noticeable when feeding and in search of food. The birds will then penetrate a thick bunch of leaves and go through, over and all around in the most thorough manner in their exploration after insects that appeal to their taste. They are very active, and constantly in motion. They are also quarrelsome, and resent the intrusion of other species. Frequently I have noticed them fighting away the White-eyed Vireo, and where two or more Bachman's Warblers are observed together, one is pretty sure to see them chasing and fighting among themselves. When disturbed or alarmed they are at once alert; a sharp alarm note, something like that of a Yellow-throated Warbler (*D. dominica*), is uttered, but more forcible and clear cut in its delivery. This is accompanied with a few jerks of the tail, and the bird is off to a neighboring tree. They are found alike in the trees, low bushes, and shrubbery, sometimes on or quite near the ground, and seem to prefer the heavy and more thickly grown woods to trees or bushes more in the open. Young birds were quite tame, but the adults as a rule were very shy and difficult to approach after having been once disturbed."

Mr. Atkins secured a series of some forty odd of these interesting birds during the fall migration above alluded to, *i. e.*, during July and August, 1889.

During the season of 1888 the birds remained at Key West somewhat later, the last observed being on September 5.

Helminthophila pinus. BLUE-WINGED WARBLER. — Apparently rare on the Gulf coast of Florida. I have been unable to detect its presence in the vicinity of Tarpon Springs. Mr. Atkins did not meet with it at Punta Rassa, and has only found it on a single occasion at Key West, August 30, 1887, when he secured a single bird and saw no others.

Helminthophila chrysoptera. GOLDEN-WINGED WARBLER. — Another

rare migrant on the Gulf coast. Not met with in the vicinity of Tarpon Springs, nor at Punta Rassa. Mr. Atkins secured an adult female bird at Key West, August 25, 1889. This is the only time he has met with the species at this point.

Helminthophila celata. ORANGE-CROWNED WARBLER. — Not observed at Tarpon Springs, but Mr. Atkins has found it at Key West, as a not uncommon fall migrant. "Common at Key West on October 5, 1887, and for a few days after." "First arrival, Key West, September 8, 1889." — J. W. Atkins.

Helminthophila peregrina. TENNESSEE WARBLER. — Not common as a migrant in the vicinity of Tarpon Springs. Mr. Atkins took examples at Punta Rassa on April 10, 1886, but says "the birds were rare." Again he found them at Key West in October, 1887, associated with *H. celata*, though not nearly as common as that species.

Compsothlypis americana. PARULA WARBLER. — A rather common migrant in the spring and fall on the Gulf coast of Florida. Spring arrival at Tarpon Springs late March and early April, remaining about a month. Returns in late August or the first week of September. No noted in the winter. Mr. Atkins noted the bird as a migrant at Punta Rassa at approximately the same dates, and did not observe it there during the winter. He also finds the species at Key West, and remarks as follows: "Found more or less all winter at Key West, but migrants begin to arrive from the south by the middle of March, and all have passed by May 1. Returned July 30, 1888, and soon became very common. First seen returning from north on August 4, 1889."

Dendroica tigrina. CAPE MAY WARBLER. — Not an uncommon migrant in spring in the vicinity of Tarpon Springs, but not so common in the fall. Records for three years at this point give the extremes of dates on which this species was taken or noted as from April 17 to May 4.

At Punta Rassa Mr. Atkins did not find it at all common, and I append his notes from that point. "First spring arrival April 16, 1886. Returning in fall, first seen October 5, 1886." The following observations made at Key West, by the same gentleman are of interest. "At Key West the birds appeared April 11, 1887, and were observed till May 4. They returned October 14 and were here till about November 1. Were common; on October 23, 1887, I took eight specimens without moving from my position. Last year (1888) they arrived and departed about the same time."

Dendroica æstiva. YELLOW WARBLER. — Not common as spring migrants in the vicinity of Tarpon Springs, but a few remain to breed in the neighborhood. After July 20 they become more abundant, the representatives being mostly young birds of the year. After September 15 I have not observed them. Mr. Atkins says: "They are very common fall migrants at both Punta Rassa and Key West, but not noted in either place in the spring. First noted at Key West on July 26, 1889."

Dendroica cærulescens. BLACK-THROATED BLUE WARBLER. — A rather rare spring migrant in the vicinity of Tarpon Springs where I have

observed it sparingly from the 2d to the 10th of May in different years. Most of the individuals noted have been males. Not observed in the fall. Mr. Atkins says of the species: "Rare migrant in spring at Punta Rassa, recorded but once, on May 4, 1886; but in fall it is common at this point, and at Key West it is very common on both migrations and is sometimes to be found in the winter."

***Dendroica coronata*.** MYRTLE WARBLER. — Abundant migrant and common winter resident at all points on the Gulf coast of Florida. The capture of an adult female in worn breeding plumage at Key West, July 28, 1888, by Mr. J. W. Atkins, is of interest and has been recorded in 'The Auk,' Vol. V, p. 430.

***Dendroica maculosa*.** MAGNOLIA WARBLER. — This species is apparently a very rare spring migrant along the Gulf coast of Florida, and though not common in fall is of regular occurrence at that season. Mr. Atkins did not find the species at Punta Rassa, but has detected it at Key West twice in the spring, May 17, 1887, and April 27, 1889, a single bird being taken on each occasion. He sends me no records of it from Key West in the fall.

***Dendroica cærulea*.** CERULEAN WARBLER. — I have not detected the presence of this species at Tarpon Springs or at other points that have been visited on the Gulf coast. Mr. Atkins did not find the bird at Punta Rassa, but took one at Key West, April 16, 1887, and another on April 29, 1889, these being all of his records.

***Dendroica striata*.** BLACK-POLL WARBLER. — A common migrant in both spring and fall on the Gulf coast in the vicinity of Tarpon Springs and at other points where investigations have been carried on. At Tarpon Springs they arrive in spring about the last week in April and remain till about May 12-15.

In this connection it is of interest to record a great mortality among the representatives of this species, during the spring migration of 1888. It is so rare that one finds any birds dying or dead from other than accidental causes, generally connected in some way with innovations caused by the settlement of a country, as telegraph wires, light-houses, and the like, that it seems worth while to give the following details of the epidemic. It was apparently confined, so far as I am aware, to representatives of this species alone, and only to those individuals which visited the Anclote Keys and Hog Island. These Keys are four in number, and are four miles from the main land, in the Gulf, and extend in a north and south line for about twenty-five miles. I found in late April and early May many *D. striata* dead, and others apparently ill unto death on these islands, and though there was an infinite variety of other bird-life represented at the same points, yet no other species seemed to be suffering or was found dead. Of *Dendroica striata* I picked up dead on April 29, 1888, in a short walk on South Anclote Key, upwards of twenty-five.

In the fall the birds pass late in September and during October in numbers.

Mr. Atkins considers the birds as rare spring migrants at Punta Rassa,

but common in the fall, and at Key West they are very common on both migrations.

Dendroica blackburniæ. BLACKBURNIAN WARBLER. —I have but few records of the occurrence of the Blackburnian Warbler at Tarpon Springs and these are subjoined. No. 3847, ♀, *ad.*, September 1, 1886; No. 3704, ♂, *ad.*, October 1, 1886; No. 3705, ♂, young of year, October 1, 1886; No. 3934, ♂, *ad.*, October 15, 1886. Mr. Atkins did not get the birds at Punta Rassa, but has taken them twice at Key West, a single bird on October 21, 1887, and a second on July 29, 1889.

Dendroica dominica. YELLOW-THROATED WARBLER. —A rather common resident bird in the vicinity of Tarpon Springs, and breeds in numbers. Young birds of the year are fully fledged by June 7, No. 6050 of my collection being a male young of the year, taken on this date, and very like an old bird in appearance. Mr. Atkins says the species is a common resident at Punta Rassa and at Key West, particularly in winter. At Key West they do not apparently breed, as they are absent for a short time in early summer returning again about July 25.

Dendroica dominica albilora.—SYCAMORE Warbler.—At Key West on March 27, 1888, Mr. Atkins secured an adult male of this subspecies which he has kindly sent to me and which is No. 5457 of my collection. This is the only record that I am aware of from the region under consideration.

Dendroica virens. BLACK-THROATED GREEN WARBLER. —A rare migrant in the vicinity of Tarpon Springs. My only record is No. 3919, male young of year, October 15, 1886. Mr. Atkins did not meet with it at Punta Rassa and gives it as rare at Key West, where he secured single birds on October 14, 1887, and on January 28 and April 1, 1888.

Dendroica vigosii. PINE WARBLER. —A common resident in the vicinity of Tarpon Springs, breeding very abundantly. Young female birds of the year in fresh unworn plumage, taken at Tarpon Springs, have the buff shade of the underparts particularly pronounced. This phase seems quite transient, as by the middle of October, or by November 1 at latest, the color has faded very decidedly, and a yellowish wash, before this time not apparent, appears on the throat and fore part of the breast of most individuals of the sex and age referred to.

Dendroica palmarum. PALM WARBLER.—Common migrant and winter resident in the vicinity of Tarpon Springs, and at both Punta Rassa and Key West Mr. Atkins's experience is of a like nature. In the vicinity of Tarpon Springs the first arrivals in fall are about the 22d of September, and in a few days the birds are common. They remain at this point in numbers till from the 5th to 18th of April.

Dendroica palmarum hypochrysea. YELLOW PALM WARBLER.—The examples of this subspecies that I have met with in the vicinity of Tarpon Springs are of rare occurrence, but they regularly appear in small numbers late in March and early in April, remaining but a few days. I have no fall records. Mr. Atkins has sent me notes regarding these birds from both Punta Rassa and Key West, that are of similar import to the above conclusion.

Dendroica discolor. PRAIRIE WARBLER.—An abundant migrant, and many breed, in the neighborhood of Tarpon Springs. At this point I have no records of the species in winter, and it is most common in August and September. At Punta Rassa and at Key West it is abundant as a migrant, and it breeds sparingly at the former point. It winters at both places. This information is kindly furnished me by Mr. Atkins. For further remarks on this species, see Auk, Vol. IV, pp. 134-135.

Seiurus aurocapillus. OVEN-BIRD. — A rather common spring and fall migrant about Tarpon Springs, appearing in late March and early April and in September. Mr. Atkins, speaking of the species at Punta Rassa and at Key West, says: "Winters more or less commonly at both places, and is an abundant migrant, especially at Key West in fall. First arrivals at this latter point, August 19, 1889, several birds."

Seiurus noveboracensis. WATER-THRUSH. — A not common migrant in the vicinity of Tarpon Springs, where it occurs in April and in September and October. Mr. Atkins says: "It is one of the most abundant migrants at both Punta Rassa and Key West, but is represented in larger numbers at the latter than at the former point, and the fall migration is greatly in excess of the spring flight. First migrants return to Key West from the north about August 16, 1889."

Seiurus motacilla. LOUISIANA WATER-THRUSH. — I have not met with this species in Florida. Mr. Atkins regards it as rare at Key West, and he did not secure it at Punta Rassa. Key West records are July 16, 1888; April 6, 1889. "Returned from north July 16, and after this time I met with from one to four specimens, but never more than four, and that on but one occasion, every time I collected up to the latter part of August."

Geothlypis formosa. KENTUCKY WARBLER. — A rare migrant on the Gulf coast of Florida. The only record I have is of an adult male taken at Tarpon Springs, April 6, 1886. Mr. Atkins has not met with the species.

Geothlypis agilis. CONNECTICUT WARBLER. — A rare migrant. The only record that I am aware of from the Gulf coast of Florida is that of an adult female, No. 3443, taken at Anclote Keys, May 24, 1887. See Auk, Vol. V, p. 187.

Geothlypis trichas. MARYLAND YELLOW-THROAT. — A common resident species on the Gulf coast of Florida [*G. l. ignota* Chapman], supplemented during the migrations by many individuals on their way north and south. It is, Mr. Atkins says, a migrant at Key West and Punta Rassa, remaining in the winter, but probably does not breed at these points.

My friend, Mr. Chapman of the American Museum of Natural History, New York, has been studying the geographical variations of this species for some time, and to aid him in his investigations I have placed all the material which I have collected in Florida pertaining to the matter at his disposal. He promises an early report which will doubtless be novel, exhaustive, and of great interest.

Since the above was written, Mr. Chapman has concluded his investiga-

tions, which are published in this number of 'The Auk.' See *antea*, pp. 9-14.

Icteria virens. YELLOW-BREASTED CHAT. — The evidence of the occurrence of the Yellow-breasted Chat on the Gulf coast of Florida is so far of a negative character. I have been unable to detect its presence nor has Mr. Atkins found out anything with regard to its occurrence at either of the points where he has so carefully collected. It is not a little remarkable that so conspicuous a species, which breeds but little to the north of the region under consideration, and which apparently winters to the south of the United States, should be unknown at these points as a migrant.

Sylvania mitrata. HOODED WARBLER. — A rather common spring migrant in and about Tarpon Springs, but rare in the fall. It appears here late in March or early in April and remains about three weeks. I have no record of its breeding in the area under consideration. The latest fall date is on September 17, 1886. At Punta Rassa Mr. Atkins did not meet with this species, nor has he found it at all common at Key West. At that point his records are March 18, April 1 and 3, August 30, and September 13, 1887, a single bird on each day. "1889, arrived from north August 19, two or three seen later."

Setophaga ruticilla. REDSTART. — A not very common spring and fall migrant in the country about Tarpon Springs. In the spring it passes through here during the first two weeks in May, and appears again returning about August 5 to 10 and remains till the first of November. Mr. Atkins gives it as a rare spring and common fall migrant at Punta Rassa and as equally common both spring and fall at Key West. His notes in regard to the latter point are: "Last migrants northward May 21, 1887. Returned August 9, 1887; young birds of year, both sexes, taken. 1889, July 22, young of year and adult female; July 30, adult male."

(To be continued.)

NOTES ON *PIPILO FUSCUS MESOLEUCUS* AND *PIPILO ABERTI*, THEIR HABITS, NESTS AND EGGS.

BY CAPT. CHARLES E. BENDIRE.

THE CAÑON TOWHEE is a common resident throughout the year, in the southern portions of Arizona at least, and I found it especially abundant during the breeding season in 1872 in the vicinity of the present site of Camp Lowell, near Tucson, the principal town in the Territory at the time. The bird was first obtained by Dr. Kennerly, the naturalist of the Pacific Rail-